March 3, 1953 É. FRAYSUR 2,630,040

MECHANICALLY DRIVEN MUSICAL INSTRUMENT

Filed Dec. 15, 1950 2 SHEETS--SHEET 1

FIG. 1

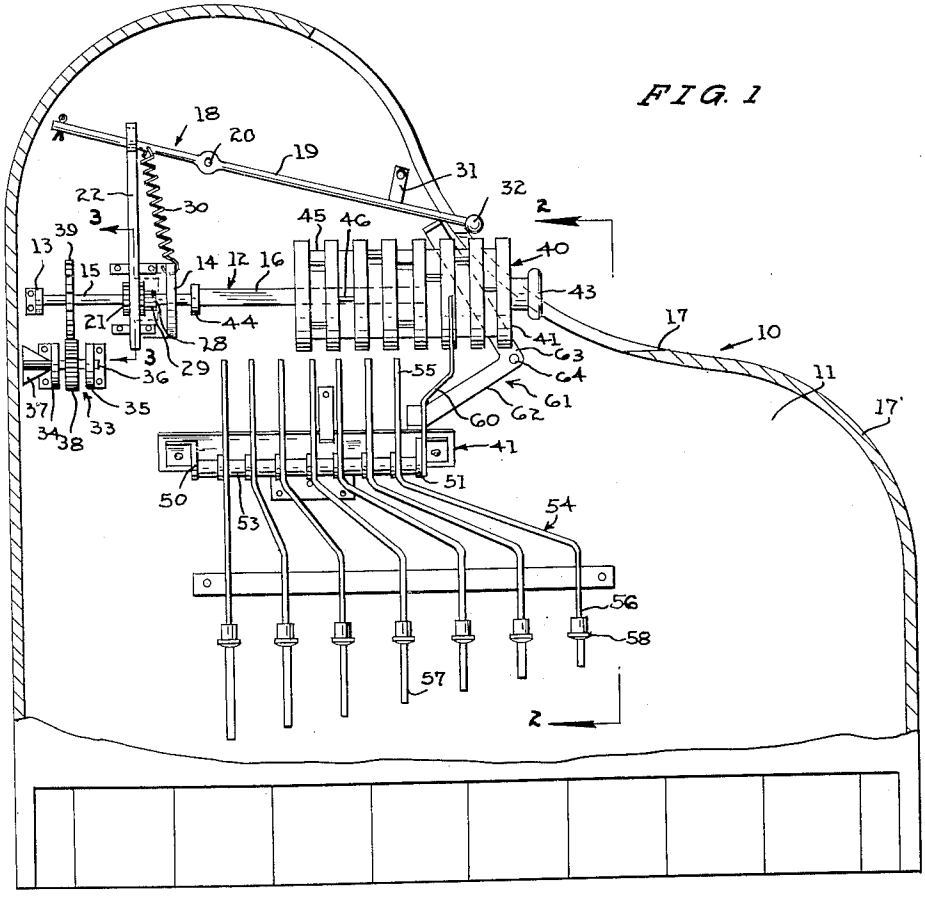


FIG. 2

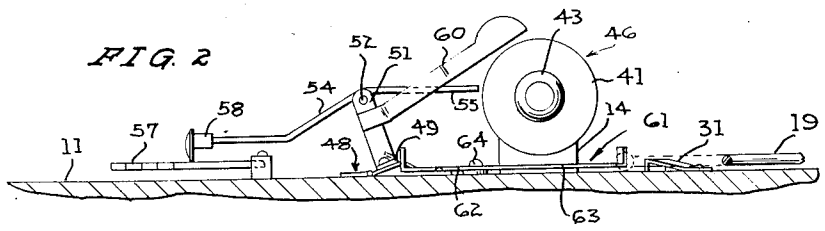
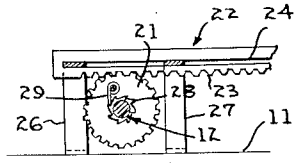


FIG. 3



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FIG. 4

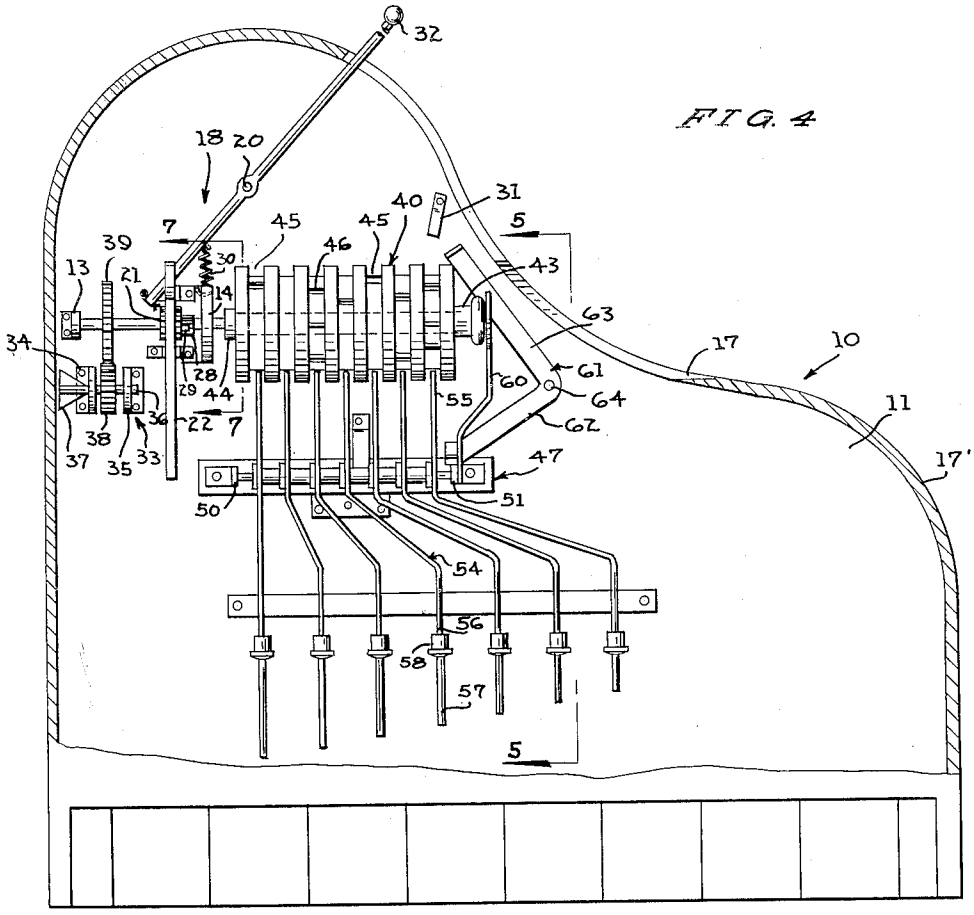


FIG. 6

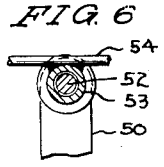


FIG. 7

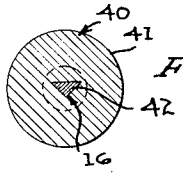


FIG. 5

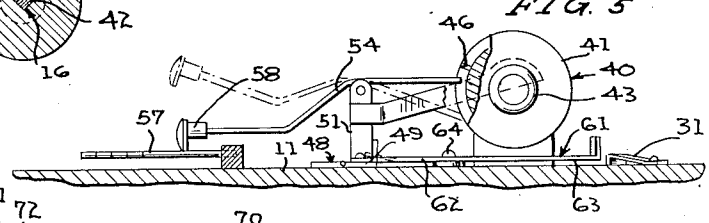


FIG. 8

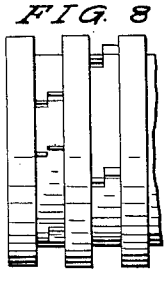
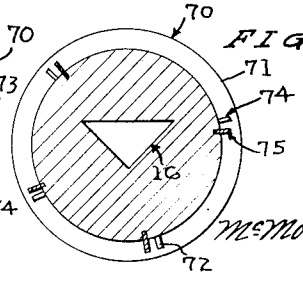


FIG. 9



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MECHANICALLY DRIVEN MUSICAL INSTRUMENT

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Application December 15, 1950, Serial No. 201,039

7 Claims. (Cl. 84—102)

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This invention relates to a mechanically driven automatic musical instrument.

An object of this invention is to provide a mechanically driven automatic musical instrument which can be simply and easily manually manipulated to play a predetermined tune.

Another object of this invention is to provide a mechanically driven automatic musical instrument which can be manipulated by a child of average intelligence and is constructed in a manner wherein the possibility of injury to the child is minimized.

A further object of this invention is to provide a mechanically driven automatic musical instrument which can be pretuned and includes a novel drive whereby the instrument can be played in locales having no available electric power, such as rural areas and resorts.

A still further object of this invention is to provide a mechanically driven automatic musical instrument which is relatively simple in structure and cheap to manufacture.

The above and still further objects and advantages of the present invention will become apparent upon consideration of the following detailed description of the invention taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a top plan view with parts broken away and shown in section, of the mechanically driven musical instrument of the present invention shown in a non-playing position;

Figure 2 is an enlarged fragmentary sectional view taken along the line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary sectional view taken along the line 3—3 of Figure 1;

Figure 4 is a top plan view with parts broken away and shown in section, of the mechanically driven automatic musical instrument of the present invention shown in the playing position;

Figure 5 is an enlarged fragmentary sectional view taken along the line 5—5 of Figure 4;

Figure 6 is an enlarged fragmentary sectional view taken along the line 6—6 of Figure 4;

Figure 7 is a sectional view taken along the line 7—7 of Figure 4;

Figure 8 is an elevational view with parts broken away, of a modified form of the tune selecting roller forming a part of the musical instrument of the present invention; and,

Figure 9 is a sectional view taken along the line 9—9 of Figure 8.

Referring now more particularly to the drawings, wherein like reference numerals have been used throughout the several views to designate like parts, there is shown the mechanically driven automatic musical instrument of the present invention generally designated by the reference numeral 10 which includes a support 11 illustrated in the form of a toy piano.

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Disposed within the piano body is a horizontally disposed shaft 12 which is mounted for rotary movement by means of the spaced brackets 13, 14. The shaft 12 includes a circular section 15 journaled between the brackets 13 and 14 and a section 16 which is triangular in cross-section and projects beyond the bracket 14 and has its free end terminating contiguous to and spaced inwardly of the slot 17 provided in the bounding wall 17' of the cabinet or support 11.

Operatively connected to the shaft 12 is a manually actuable drive structure 18 for effecting the rotary movement of the shaft. The drive structure 18 includes an actuating lever 19 which is pivotally supported intermediate its ends on an upstanding pin 20 for movement into and out of a triggering position illustrated in Figure 1. Circumposed about the shaft 12 intermediate the upstanding brackets 13, 14 is a driven gear 21 which is secured to the circular section 15 of the shaft. Carried by the actuating lever 19 is a driving ratchet 22 which is supported in engagement with the driven gear 21 and is movable longitudinally of the latter in response to the pivotal movement of the actuating lever out of the triggering position in a counterclockwise direction about the pivot pin 20. As clearly shown in Figure 3, the driving ratchet 22 has its undersurface provided with a plurality of longitudinally spaced transversely extending gear teeth 23, the ratchet being further provided with a longitudinally extending slot 24. Secured to the support 11 on opposite sides of the shaft 12 are the inverted U-shaped guide brackets 26, 27 which have their bights embracingly received and supported within the longitudinal slot 24 of the driving ratchet 22 to thereby guide the ratchet for a movement longitudinally of the driven gear 21. Secured to the shaft 12 is a ratchet 28 which is engaged by a spring biased pawl 29 carried by the driven gear 21, the pawl and ratchet cooperating to prevent the clockwise movement of the shaft 12 as viewed in Figure 3. Operatively connected to the actuator lever 19 is a spring 30 which urges the actuating lever 19 out of the triggering position illustrated in Figure 1 in a counterclockwise direction to the position illustrated in Figure 4. Carried by the support contiguous to the slot 17 is a clip 31 which is selectively engageable with the actuating lever 19 for holding the latter in the triggering position illustrated in Figure 1. As clearly shown in Figure 1, the lever 19 has one end projecting exteriorly of the cabinet and provided with a knob 32 permitting the lever to be selectively engaged and disengaged from the clip 31. Operatively connected to the shaft 12 is a governor structure generally designated by the reference numeral 33 for controlling the rate of rotation of the shaft 12 under the influence of the drive structure 18. As clearly illustrated in

Figures 1 and 4, the governor is of the air resistance type and includes a pair of spaced brackets 34, 35 carrying a horizontally disposed rotatably supported stub shaft 36. Secured to one end of the stub shaft 36 is a plurality of radially extending blades 37 which provide the desired retarding effect. The governor 33 is coupled to the drive shaft 12 by means of a pair of meshing gears 38, 39, the gear 38 being secured to the stub shaft 36 and the gear 39 being secured to the circular section 15 of the shaft 12.

Disposed longitudinally of the triangular section 16 of the shaft 12 is a tune selecting roller 40 which is removably supported on the shaft 12 contiguous to the free end thereof. The tune selecting roller 40 includes an elongated cylindrical body 41 which is provided with a bore 42 which extends inwardly from one end thereof and terminates at a point contiguous to and spaced from the other end thereof, the bore 42 being triangular in cross section and complementary to the shaft section 16. Projecting exteriorly of the end of the body 41 remote from the open end of the bore 42 is a knob 43 which permits the roller 40 to be manually grasped and moved to the supported position illustrated in Figure 4 abutting against the stop 44 carried by the shaft 12. The elongated cylindrical body 41 is provided with a plurality of longitudinally spaced transversely extending annular grooves 45. Secured at spaced intervals along each of the grooves 45 are picks 46 for a purpose to be subsequently described.

Overlying the support 11 is a movable base 47 which is mounted on the support for swinging movement about an axis spaced from the shaft 12 into and out of the supported position on the support. The movable base 47 includes a base plate 48 having a hinged section 49 which is movable from the position illustrated in Figure 5 confronting and abutting the support 11 to the position illustrated in Figure 2 at an angle with respect to the support 11. Secured to the hinge section 49 of the base plate 48 is a pair of upstanding brackets 50, 51 which support a hinge pin 52, the hinge pin rotatably supporting a plurality of sleeves 53 rotatably mounted in end to end aligned relation with respect to each other. Disposed in side by side spaced relation with respect to each other transversely of the base 47 is a plurality of roller engaging arms 54. Each of the arms is separately mounted on the base 47 for pivotal movement about the pivot pin, the pivotal support for each of the arms 54 comprising the adjacent one of the sleeves 53. Each of the arms 54 has the end thereof contiguous to the tune selecting roller 40 intermittently engageable with the adjacent picks 46 for selectively pivoting the other end of the arms toward the support 11 in response to the rotary movement of the shaft 12. As clearly shown in Figures 1 and 2, the arms 54 are in the non-playing position with respect to the tune selecting roller 40 when the hinge section 49 of the base 47 is in the inclined position. Upon effecting the movement of the hinge section 49 to the normal position supported on the base, illustrated in Figures 4 and 5, the ends 55 of the roller engaging arms 54 are brought into operative relation with respect to the aligned one of the grooves 45 carrying the picks 46.

Arranged in operative relation with respect to the ends 56 of the arms 54 are suitable sounding elements 57 for producing a note in response to to the movement of the end 56 of the arms 54 toward the support 11. As illustrated, the ends

56 of the arms 54 carry striker elements 58 which engage with the sounding elements 57, the elements being illustrated as sounding rods of various lengths. It is to be noted however that the instrument of the present invention contemplates the use of any of a multiplicity of sounding elements such as bells, whistles, taut wires, and the like.

Carried by the upstanding bracket 51 of the base 47 is an abutment plate 60 which is movable into the positiin bridging the free end of the triangular section 16 of the shaft 12 and confronting the knob 43 of the tune selecting roller 40 for preventing the removal of the tune selecting roller 40 from the shaft while the instrument is in operation.

Carried by the support 11 intermediate the actuating lever 19 and the base 47 is a bell crank lever 61 which is pivotally supported intermediate its arms 62, 63 by means of an upstanding pivot pin 64. The bell crank lever 61 has its arm engageable with the adjacent end of the actuating lever 19 upon movement of the actuating lever out of the triggering position illustrated in Figure 1 in a clockwise direction. The subsequent counterclockwise movement of the bell crank 61 about the pivot pin 64 urges the arm 62 of the bell crank lever 61 into engagement with the pivoted section 49 of the base 47 to urge the section 49 from the position illustrated in Figure 5 to the position illustrated in Figure 2. As clearly shown in Figure 2, the abutment plate 60 is brought out of the bridging position with respect to the shaft and the position confronting the knob 43 of the roller 40 to permit the roller to be removed from the shaft.

In actual use, the desired tune selecting roller 40 is placed onto the triangular section 16 of the shaft 12 by pivoting the actuating lever 19 out of the triggered position illustrated in Figure 1 in a clockwise direction until the bell crank lever urges the arms 54 and the abutment plate 60 into the non-playing position of Figure 1. After the roller has been placed on the shaft, the lever 19 can be engaged with the clip 31 until such time as the instrument is to be used. Upon releasing the lever 19 frim the clip 31, the drive structure 18 will effect the desired counterclockwise rotary movement of the shaft 12 and select ones of the picks 46 will engage with the adjacent ends of the arms 54 to intermittently urge the arms from the full line position of Figure 5 to the broken line position illustrated therein wherein subsequent movement of the roller will permit the arms to drop onto the sounding elements 57.

In Figures 8 and 9 there is shown a modified form of the tune selecting roller of the present invention. The roller 70 includes a transversely extending longitudinally spaced groove 71, the groove supporting the picks 72, the picks each terminating at a point spaced from the outer periphery of the body 73 of the roller 70. The picks 72 are arranged in two groups 74, 75, arranged in side by side relation with respect to each other, the picks 72 of the group 74 being offset with respect to the picks 72 of the group 75.

It is readily apparent that numerous other modifications can be made without departing from the spirit of the invention as set forth in the appended claims.

What I claim is:

1. A musical instrument comprising a support, a horizontally disposed shaft positioned above said support and rotatably mounted on the latter, manually actuable drive means operatively

connected to said shaft for rotating the latter, a tune selecting roller disposed longitudinally of said shaft and contiguous to one end thereof and removably supported thereon, an elongated movable base overlying said support and mounted on the latter for swinging movement about an axis spaced from said shaft into and out of a supported position on said support, a pair of upstanding brackets carried by the base, a horizontal pin extending between the brackets above the base, a plurality of sleeves mounted on the pin for rotation independently of one another, a plurality of arms disposed in side-by-side spaced relation with respect to each other upon said base and each connected intermediate its ends to a separate sleeve for pivotal movement about a horizontal axis, a plurality of radial picks on the roller, each of said arms having one end in the path of selected picks of the tune-selecting roller in said supported position of the base for pivoting of the arms on said pin to effect the movement of the other ends of the arms through an arcuate path in response to the rotary movement of said shaft, and a plurality of sounding elements mounted on the support in the path of movement of the second-named ends of the arms, said elements being struck by the second-named ends of the arms to sound notes, responsive to pivotal movement of the arms upon the pin.

2. A musical instrument comprising a support, a horizontally disposed shaft positioned above said support and rotatably mounted on the latter, manually actuable drive means operatively connected to said shaft for rotating the latter, a tune selecting roller disposed longitudinally of said shaft and contiguous to one end thereof and removably supported thereon, an elongated movable base overlying said support and mounted on the latter for swinging movement about an axis spaced from said shaft into and out of a supported position on said support, a pair of upstanding brackets carried by the base, a horizontal pin extending between the brackets above the base, a plurality of sleeves mounted on the pin for rotation independently of one another, a plurality of arms disposed in side-by-side spaced relation with respect to each other upon said base and each connected intermediate its ends to a separate sleeve for pivotal movement about a horizontal axis, a plurality of radial picks on the roller, each of said arms having one end in the path of selected picks of the tune-selecting roller in said supported position of the base for pivoting of the arms on said pin to effect the movement of the other ends of the arms through an arcuate path in response to the rotary movement of said shaft, and a plurality of sounding elements mounted on the support in the path of movement of the second-named ends of the arms, said elements being struck by the second-named ends of the arms to sound notes, responsive to pivotal movement of the arms upon the pin, said manually actuable drive means comprising an actuating lever pivotally mounted on the support for movement into and out of a triggering position, a driven gear circumposed about said shaft and secured thereto, a drive ratchet carried by said actuating lever and arranged transversely of the shaft in mesh with said driven gear to rotate the latter in response to the pivotal movement of said actuating lever out of said triggering position in one direction, and spring means operatively connected to said actuating lever for urging the latter out of said triggering position in said one direction.

3. A musical instrument comprising a support, a horizontally disposed shaft positioned above said support and rotatably mounted on the latter, manually actuable drive means operatively connected to said shaft for rotating the latter, a tune selecting roller disposed longitudinally of said shaft and contiguous to one end thereof and removably supported thereon, an elongated movable base overlying said support and mounted on the latter for swinging movement about an axis spaced from said shaft into and out of a supported position on said support, a pair of upstanding brackets carried by the base, a horizontal pin extending between the brackets above the base, a plurality of sleeves mounted on the pin for rotation independently of one another, a plurality of arms disposed in side-by-side spaced relation with respect to each other upon said base and each connected intermediate its ends to a separate sleeve for pivotal movement about a horizontal axis, a plurality of radial picks on the roller, each of said arms having one end in the path of selected picks of the tune-selecting roller in said supported position of the base for pivoting of the arms on said pin to effect the movement of the other ends of the arms through an arcuate path in response to the rotary movement of said shaft, and a plurality of sounding elements mounted on the support in the path of movement of the second-named ends of the arms, said elements being struck by the second-named ends of the arms to sound notes, responsive to pivotal movement of the arms upon the pin, said manually actuable drive means comprising an actuating lever pivotally mounted on the support for movement into and out of a triggering position, a driven gear circumposed about said shaft and secured thereto, a drive ratchet carried by said actuating lever and arranged transversely of the shaft in mesh with said driven gear to rotate the latter in response to the pivotal movement of said actuating lever out of said triggering position in one direction, spring means operatively connected to said actuating lever for urging the latter out of said triggering position in said one direction, and a clip carried by said support and engaging said actuating lever for releasably holding the latter in said triggering position.

4. A musical instrument comprising a support, a horizontally disposed shaft positioned above said support and rotatably mounted on the latter, manually actuable drive means operatively connected to said shaft for rotating the latter, a tune selecting roller disposed longitudinally of said shaft and contiguous to one end thereof and removably supported thereon, an elongated movable base overlying said support and mounted on the latter for swinging movement about an axis spaced from said shaft into and out of a supported position on said support, a pair of upstanding brackets carried by the base, a horizontal pin extending between the brackets above the base, a plurality of sleeves mounted on the pin for rotation independently of one another, a plurality of arms disposed in side-by-side spaced relation with respect to each other upon said base and each connected intermediate its ends to a separate sleeve for pivotal movement about a horizontal axis, a plurality of radial picks on the roller, each of said arms having one end in the path of selected picks of the tune-selecting roller in said supported position of the base for pivoting of the arms on said pin to effect the movement of the other ends of the arms through an arcuate path in response to the rotary movement of said

shaft, and a plurality of sounding elements mounted on the support in the path of movement of the second-named ends of the arms, said elements being struck by the second-named ends of the arms to sound notes, responsive to pivotal movement of the arms upon the pin, said manually actuable drive means comprising an actuating lever pivotally mounted on the support for movement into and out of a triggering position, a driven gear circumposed about said shaft and secured thereto, a drive ratchet carried by said actuating lever and arranged transversely of the shaft in mesh with said driven gear to rotate the latter in response to the pivotal movement of said actuating lever out of said triggering position in one direction, spring means operatively connected to said actuating lever for urging the latter out of said triggering position in said one direction, and a bell crank lever pivotally connected intermediate its ends to said support and extending between said actuating lever and said base for urging the latter out of said supported position in response to the movement of said actuating lever out of said triggering position in the opposite direction.

5. A musical instrument comprising a support, a horizontally disposed shaft positioned about said support and rotatably mounted on the latter, manually actuable drive means operatively connected to said shaft for rotating the latter, a tune selecting roller disposed longitudinally of said shaft and contiguous to one end thereof and removably supported thereon, an elongated movable base overlying said support and mounted on the latter for swinging movement about an axis spaced from said shaft into and out of a supported position on said support, a pair of upstanding brackets carried by the base, a horizontal pin extending between the brackets above the base, a plurality of sleeves mounted on the pin for rotation independently of one another, a plurality of arms disposed in side-by-side spaced relation with respect to each other upon said base and each connected intermediate its ends to a separate sleeve for pivotal movement about a horizontal axis, a plurality of radial picks on the roller, each of said arms having one end in the path of selected picks of the tune-selecting roller in said supported position of the base for pivoting of the arms on said pin to effect the movement of the other ends of the arms through an arcuate path in response to the rotary movement of said shaft, and a plurality of sounding elements mounted on the support in the path of movement of the second-named ends of the arms, said elements being struck by the second-named ends of the arms to sound notes, responsive to pivotal movement of the arms upon the pin, said manually actuable drive means comprising an actuating lever pivotally mounted on the support for movement into and out of a triggering position, a driven gear circumposed about said shaft and secured thereto, a drive ratchet carried by said actuating lever and arranged transversely of the shaft in mesh with said driven gear to rotate the latter in response to the pivotal movement of said actuating lever out of said triggering position in one direction, spring means operatively connected to said actuating lever for urging the latter out of said triggering position in said one direction, a bell crank lever pivotally connected intermediate its ends to said support and extending between said actuating lever and said base for urging the latter out of said supported position in response to the movement of said actuating lever out of said triggering position in the opposite direction, and an abutment plate secured at one end to said base and having its other end extending transversely of the shaft for movement into a position bridging said one end of said shaft and engaging one end of the roller in response to the movement of said base into said supported position, for preventing the removal of said tune selecting roller from said shaft.

6. A musical instrument comprising a support, a horizontally disposed shaft positioned above said support and rotatably mounted on the latter, manually actuable drive means operatively connected to said shaft for rotating the latter, a tune selecting roller disposed longitudinally of said shaft and contiguous to one end thereof and removably supported thereon, an elongated movable base overlying said support and mounted on the latter for swinging movement about an axis spaced from said shaft into and out of a supported position on said support, a pair of upstanding brackets carried by the base, a horizontal pin extending between the brackets above the base, a plurality of sleeves mounted on the pin for rotation independently of one another, a plurality of arms disposed in side-by-side spaced relation with respect to each other upon said base and each connected intermediate its ends to a separate sleeve for pivotal movement about a horizontal axis, a plurality of radial picks on the roller, each of said arms having one end in the path of selected picks of the tune-selecting roller in said supported position of the base for pivoting of the arms on said pin to effect the movement of the other ends of the arms through an arcuate path in response to the rotary movement of said shaft, and a plurality of sounding elements mounted on the support in the path of movement of the second-named ends of the arms, said elements being struck by the second-named ends of the arms to sound notes, responsive to pivotal movement of the arms upon the pin, and governor means operatively connected to said shaft for controlling the rate of rotation of said shaft.

7. In a musical instrument including a shaft, a manually actuable drive means operatively connected to said shaft for rotating the latter, said manually actuable drive means comprising an actuating lever pivotally mounted on the support for movement into and out of a triggering position, a driven gear circumposed about said shaft and secured thereto, a driving ratchet carried by said actuating lever and arranged transversely of the shaft in mesh with said driven gear to rotate the latter in response to the pivotal movement of said actuating lever out of said triggering position in one direction, and spring means operatively connected to said actuating lever for urging the latter in said one direction out of said triggering position.

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